

REMARKS

This Amendment is submitted in response to the non-final Office Action mailed on September 16, 2010. No fee is due in connection with this Amendment. The Director is authorized to charge any additional fees which may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 3712174-00463 on the account statement.

Claims 13-27 are pending in this application. Claims 1-12 were previously canceled without prejudice or disclaimer. In the Office Action, Claims 13-27 are rejected under 35 U.S.C. §103. In response, Claims 13, 15-16 and 22-24 have been amended, and Claim 14 has been canceled. In view of the amendments and/or for at least the reasons set forth below, Applicant respectfully submits that the rejections should be withdrawn.

Applicant respectfully notes that Claims 15-16 and 22 have been amended solely for clarification purposes to reflect the cancellation of Claim 14. These amendments do not add new matter. The amendments are supported in the Specification at, for example, Abstract; page 2, paragraphs 12-13 and 19; page 3, paragraph 41; pages 3-4, paragraph 42; page 4, paragraphs 43 and 47-48; page 5, paragraphs 53-55; pages 5-6, paragraph 56; page 6, paragraph 63; pages 6-7, paragraph 64; page 7, paragraph 65; Figs. 1A-3C.

In the Office Action, Claims 13-16, 21, 23 and 25-26 are rejected under 35 U.S.C. §103(a) as being unpatentable over Japanese Patent Publication No. 07-249419 A to Goto et al. ("*Goto*") in view of U.S. Patent No. 5,258,239 to Kobayashi ("*Kobayashi*"). In response, Applicant has amended Claims 13, 15-16 and 23 and have canceled Claim 14. In view of the amendments and/or for at least the reasons set forth below, Applicant respectfully submits that, even if combinable, *Goto* and *Kobayashi* fail to disclose or render obvious each and every element of independent Claims 13 and 23 and Claims 14-16, 21 and 25-26 that depend therefrom. Moreover, one of ordinary skill in the art would have no reason to combine the teachings of *Goto* and *Kobayashi* to arrive at the present claims.

Currently amended independent Claims 1 and 23 recite, in part, a fuel cell separator comprising: a separator body adapted to contact with a generating element to create electrical continuity to said generating element, thereby forming a generating cell, wherein the generating element is a MEA adapted to receive hydrogen gas or methanol as fuel; a fluid oxidant supply channel formed on said separator body to supply a fluid oxidant to said generating element; and

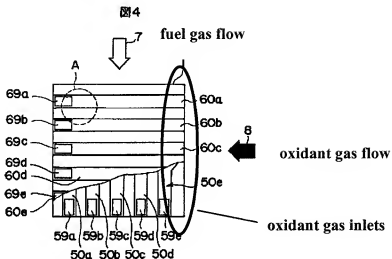
at least one element selected from the group consisting of a fan and a pump provided within said separator body for supplying said fluid oxidant into said fluid oxidant supply channel, wherein the element selected from the group consisting of a fan and a pump is provided at an opening on an inlet end of the fluid oxidant supply channel. By providing the fluid oxidant supply fan or pump within the separator body of the fuel cell, the size of the fuel cell may be reduced. See, Specification, pages 1-2, paragraph 10. Furthermore, by providing the oxidant supply fan or pump at an opening on an inlet end of the channel, variations in the amount of fluid oxidant to be supplied to the channels of the separator may be reduced, thereby allowing for stable power generation in the fuel cell. See, Specification, page 2, paragraphs 11-12. In contrast, the cited references are deficient with respect to the present claims.

For example, even if combinable, *Goto* and *Kobayashi* fail to disclose or suggest at least one element selected from the group consisting of a fan and a pump provided within said separator body for supplying said fluid oxidant into said fluid oxidant supply channel as recited, in part, by independent Claims 13 and 23. The Patent Office asserts that *Goto* teaches flow quantity control valves provided within the separator body for supplying fluid oxidant into the fluid oxidant channel. See, Office Action, page 3, lines 6-8. However, contrary to the Patent Office's assertion, *Goto* merely teaches using its flow quantity control valves to do just that – ***control the flow*** of oxidant in the oxidant channels – not to supply the fluid oxidant. See, *Goto*, Abstract; paragraphs 25-26 and 44.

In fact, *Goto* is entirely directed to using its flow control valves to control the amount of fuel and oxidant gas flow in response to the temperature and thus ***control the temperature*** of the fuel cell. See, *Goto*, Abstract; paragraphs 14-15, 22, 24-26, 33-34. Nowhere does *Goto* teach or suggest that its flow control valves are used to supply oxidant to the fluid oxidant channel. To the contrary, *Goto* teaches that its flow control valves 59 and 69 are arranged near the exit of the fuel gas and oxidant gas flow channels, respectively. See, *Goto*, paragraphs 43-44 and 46-50; Drawings 4-6. As such, one of ordinary skill in the art would understand that the flow control valves of *Goto* are not for supplying fluid oxidant into said fluid oxidant supply channel as required, in part, by the present claims. Instead, *Goto* teaches using an air supply pump 92 located outside the separator 1 to supply the fluid oxidant into the channel. See, *Goto*, paragraph 39; Drawing 1.

The Patent Office admits that *Goto* fails to teach that its flow control valves are a fan or a pump and instead relies on *Kobayashi* for the disclosure of a diaphragm pump which is integrated within the cell casing to provide air supply control. See, Office Action, page 3, lines 9-22. Specifically, the Patent Office asserts that it would have been obvious “to apply *Kobayashi*’s diaphragm pump in place of the flow control valves in *Goto*’s separator channels because *Kobayashi* teaches that this pump is a device placed in the air flow channel which can provide air supply control and enhance the electrical characteristics of the cell.” See, Office Action, page 3, lines 18-22. However, *Kobayashi* merely discloses an air pump 8 which is external to its separator 5 and air diffusion chamber 2. See, *Kobayashi*, column 2, lines 44-64; Fig. 1. As such, even if *Goto* and *Kobayashi* are combined, at best such combination teaches merely a flow control means (i.e., the diaphragm pump of *Kobayashi*) provided within the separator body and air supply means (i.e., the pump 92 of *Goto*) provided external to the separator body. Neither *Goto* nor *Kobayashi* teaches a fan, a pump or another element for supplying oxidant gas provided within the separator body. Therefore, contrary to the Patent Office’s assertion, even if combinable, the combination of *Goto* and *Kobayashi* fails to disclose or suggest at least one element selected from the group consisting of a fan and a pump provided within said separator body for supplying said fluid oxidant into said fluid oxidant supply channel in accordance with the present claims.

Moreover, even if combinable, *Goto* and *Kobayashi* fail to disclose or suggest that the element selected from the group consisting of a fan and a pump is provided at an opening on an inlet end of the fluid oxidant supply channel as recited, in part, by independent Claims 13 and 23. The Patent Office asserts that *Goto* recognizes the need to control oxidant flow “using a flow control valve placed within the separator body at the inlet point of the channel.” See, Office Action, page 8, lines 17-19. However, contrary to the Patent Office’s assertion, *Goto* expressly teaches that its flow control valves 59 are “arranged near the exit of each slot 50.” See, *Goto*, paragraph 44. In addition, *Goto*’s drawings showing the direction of gas flow and the locations of its valves 59 and 69 indicate that the valves 59 and 69 are placed at the outlet of slots 50 and 60, respectively. See, *Goto*, paragraph 50, Drawings 4-6.



See, *Goto*, paragraph 50; Drawing 4. *Kobayashi* merely teaches a diaphragm pump 8 located within a cell casing but external to the separator 5. See, *Kobayashi*, column 2, lines 44-64; Fig. 1. Thus, even if combinable, *Goto* and *Kobayashi* fail to disclose or even suggest a fan or a pump provided at an opening on an inlet end of the fluid oxidant supply channel.

Furthermore, one of ordinary skill in the art would have no reason to combine *Kobayashi* with *Goto* to arrive at the present claims. The Patent Office asserts that it would have been obvious to replace the flow control valves of *Goto* with the diaphragm pump of *Kobayashi*. See, Office Action, page 3, lines 18-22. However, “[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art.” See, M.P.E.P. §2143.01(III) (2009).

Goto is entirely directed to a fuel cell having improved temperature control using control valves in its gas passages. See, *Goto*, Abstract; paragraphs 10-18; Drawing 1. In contrast, *Kobayashi* is directed to a metal-air cell or battery using zinc as the negative electrode fuel which includes a small fan within the battery casing in order to reduce the size of the battery. See, *Kobayashi*, Abstract; column 2, lines 5-18. One of ordinary skill in the art would understand that a metal-air cell operates like a battery and is entirely distinguishable from a fuel cell in which the generating element is a MEA adapted to receive hydrogen gas or methanol as fuel as required by the present claims. In fact, the entire design of the metal-air cell of *Kobayashi* is distinguishable from that of a hydrogen or methanol-based fuel cell such as *Goto*. As such, one of ordinary skill would have had no reason to substitute the diaphragm pump of *Kobayashi* for the control valves of *Goto* to arrive at the present claims with a reasonable expectation of success because the references are directed to different problems in different fields of endeavor.

Furthermore, Applicant respectfully notes that one of ordinary skill in the art would have no reason to substitute the control valves of *Goto* with the air supply pump of *Kobayashi* because it would change the principle of operation of *Goto* and/or render *Goto* unsatisfactory for its intended purpose. "If [the] proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. . . . [In addition, if] the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." See, M.P.E.P. § 2143.01 (2008).

As discussed previously, *Goto* is entirely directed to a fuel cell having improved temperature control due to the control valves in the gas passages. See, *Goto*, Abstract; paragraphs 10-18; Drawing 1. *Goto* teaches that control valves 69 are necessary in addition to an air supply pump 92 to precisely control the amount of air supplied to the fuel cell. See, *Goto*, Abstract; paragraphs 39 and 46. As such, one of ordinary skill in the art would have no reason to replace the control valves 69 of *Goto* with the air supply pump of *Kobayashi* because *Goto* is entirely directed to using control valves to precisely control the temperature of the fuel cell.

In response to Applicant's arguments, the Patent Office asserts that both *Goto* and *Kobayashi* teach controlling the inflow of an oxidant into a channel and that one of ordinary skill in the art would recognize the use of differing devices for the same purpose and would be motivated to modify the teachings of one reference with another. See, Office Action, page 8, lines 21-22; page 9, lines 1-5. However, contrary to the Patent Office's assertions, *Goto* teaches placing its flow control valves at the exit of the channels to adjust the flow rate of gas through the channels and thereby control the temperature in the fuel cell. See, *Goto*, paragraphs 44 and 50; Drawings 4-6. Nowhere does *Goto* teach using its control valves to control the inflow of oxidant into a channel. Instead, *Goto* teaches an air supply pump 92 for supplying oxidant into the channel and thus controlling the inflow of oxidant gas. See, *Goto*, paragraph 39; Drawing 1. As such, the control valves of *Goto* are not used for the same purpose as the pump of *Kobayashi* and, thus, one of ordinary skill in the art would have no reason to replace the outlet flow control valves of *Goto* with the air supply pump of *Kobayashi*.

Accordingly, Applicant respectfully requests that the rejection of Claims 13-16, 21, 23 and 25-26 under 35 U.S.C. §103(a) to *Goto* and *Kobayashi* be withdrawn.

In the Office Action, Claims 17-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Goto* in view of *Kobayashi* and further in view of U.S. Patent No. 6,500,575 B1 to Shiue et al. ("*Shiue*"). Applicant respectfully submits that, even if combinable, the cited references fail to disclose or suggest each and every element of Claims 17-20 for at least the reasons set forth below.

As discussed previously, the combination of *Goto* and *Kobayashi* fails to disclose or suggest at least one element selected from the group consisting of a fan and a pump provided within said separator body for supplying said fluid oxidant into said fluid oxidant supply channel, wherein the element selected from the group consisting of a fan and a pump is provided at an opening on an inlet end of the fluid oxidant supply channel as required, in part, by independent Claim 13 from which Claims 17-20 depend. The Patent Office relies on *Shiue* merely for the disclosure of a micro fan as a fluid oxidant supply means. See, Office Action, page 5, lines 9-20. Nowhere does *Shiue* teach or suggest that its micro fan is provided within the separator body, nor does the Patent Office cite support for such claimed element. Instead, *Shiue* teaches that its micro fans 15 are provided in the first and second caps 18a and 18b external to the separator sheet 122. See, *Shiue*, column 3, lines 60-67; column 4, lines 1-25; Fig. 1. Thus, Applicant respectfully submits that, even if combinable, *Shiue* fails to remedy the deficiencies of *Goto* and *Kobayashi* with respect to Claims 17-20.

Accordingly, Applicant respectfully requests that the rejection of Claims 17-20 under 35 U.S.C. §103(a) to *Goto*, *Kobayashi* and *Shiue* be withdrawn.

In the Office Action, Claim 22 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Goto* in view of *Kobayashi* and further in view of *Shiue* and U.S. Patent No. 5,856,035 to Khandkar et al. ("*Khandkar*"). Applicant respectfully submits that, even if combinable, the cited references fail to disclose or suggest each and every element of Claim 22 for at least the reasons set forth below.

As discussed previously, the combination of *Goto*, *Kobayashi* and *Shiue* fails to disclose or suggest at least one element selected from the group consisting of a fan and a pump provided within said separator body for supplying said fluid oxidant into said fluid oxidant supply channel, wherein the element selected from the group consisting of a fan and a pump is provided at an opening on an inlet end of the fluid oxidant supply channel as required, in part, by independent Claim 13 from which Claim 22 depends. The Patent Office relies on *Khandkar*

merely for the disclosure of an elongated opening for air flow. See, Office Action, page 6, lines 4-20. Nowhere does *Khandkar* teach or suggest that a fan or a pump is provided within the separator body, nor does the Patent Office cite support for such claimed element. Thus, Applicant respectfully submits that, even if combinable, *Khandkar* fails to remedy the deficiencies of *Goto*, *Kobayashi* and *Shiue* with respect to Claim 22.

Accordingly, Applicant respectfully requests that the rejection of Claim 22 under 35 U.S.C. §103(a) to *Goto*, *Kobayashi*, *Shiue* and *Khandkar* be withdrawn.

In the Office Action, Claims 24 and 27 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Goto* in view of *Kobayashi* and further in view of U.S. Patent No. 6,127,058 to Pratt et al. ("*Pratt*"). Applicant respectfully submits that, even if combinable, the cited references fail to disclose or suggest each and every element of Claims 24 and 27 for at least the reasons set forth below.

As discussed previously, the combination of *Goto* and *Kobayashi* fails to disclose or suggest at least one element selected from the group consisting of a fan and a pump provided within said separator body for supplying said fluid oxidant into said fluid oxidant supply channel, wherein the element selected from the group consisting of a fan and a pump is provided at an opening on an inlet end of the fluid oxidant supply channel as required, in part, by independent Claim 24 and Claim 27 that depends therefrom. The Patent Office relies on *Pratt* merely for the disclosure of a plurality of fuel cell bodies connected to each other on a board. See, Office Action, page 7, lines 5-21. Nowhere does *Pratt* teach a fan or a pump provided within the separator body of its fuel cells, nor does the Patent Office cite support for such claimed element. Thus, Applicant respectfully submits that, even if combinable, *Pratt* fails to remedy the deficiencies of *Goto* and *Kobayashi* with respect to Claims 24 and 27.

Accordingly, Applicant respectfully requests that the rejection of Claims 24 and 27 under 35 U.S.C. §103(a) to *Goto*, *Kobayashi* and *Pratt* be withdrawn.

For the foregoing reasons, Applicant respectfully submits that the present application is in condition for allowance and earnestly solicit reconsideration of same.

Respectfully submitted,

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